IN THE CLAIMS:

Please cancel claims 1, 7-12, 15, 17-19, 21-26, 33-38, 41-45, 47-52, 56, and 58. The following listing of the claims represents the claims now present in this application. This listing supersedes and replaces all prior claim listings.

1. (Canceled)

2. (Original) A method of making an engineered blood vessel comprising an endothelial intimal layer surrounded by a smooth muscle medial layer, said method comprising contacting one or more mitogenic with one or more attractant factors or one or more mitoattractant factors or combinations thereof with a matrix, said matrix having incorporated therein at least ECs and SMCs, said matrix and cells being circumferentially positioned around a tubular support, said factors having been added to the inside of the tubular support, said support having allowed said factors to move from the inside of the tube to the ECs in the matrix, wherein said contacting results in the formation of said endothelial intimal layer surrounded by said smooth muscle medial layer

3. (Original) The method of claim 2, wherein the ECs are derived from stem cells.

4. (Original) The method of claim 3, wherein the stem cells are selected from the group consisting of embryonic stem cells, embryonic germ cells, multipotent adult progenitor cells (MAPCs), hematopoietic stem cells, mesenchymal stem cells, and endothelial progenitor cells.

5. (Original) The method of claim 2, wherein the SMCs are derived from stem cells.

6. (Original) The method of claim 5, wherein the stem cells are selected from the group consisting of embryonic stem cells, embryonic germ cells, MAPCs, mesenchymal stem cells, and smooth muscle progenitor cells.

7-12. (Canceled)

13. (Currently amended) The method of claim 3 ~~or 5~~, wherein the stem cells are derived from bone marrow, brain, spinal cord, umbilical cord blood, liver, muscle, fat or placenta.

14. (Original) The method of claim 2, wherein the matrix is comprised of a substance selected from the group consisting of fibrin, collagen, amphiphilic di-block copolymers, amphiphilic tri-block copolymers, and peptides.

15. (Canceled)

16. (Original) The method of claim 2, wherein the support is comprised of porous plastic.

17-19. (Canceled)

20. (Original) The method of claim 2, wherein the factor is vascular endothelial growth factor.

21-26. (Canceled)

27. (Original) An engineered blood vessel produced by the method of claim 2.

28. (Original) A composition in vitro comprising a matrix containing incorporated ECs and SMCs, said matrix containing said incorporated cells being circumferentially positioned around a tubular support, said support allowing movement of mitogenic, attractant, and mitoattractant factors across the support to said ECs, said composition comprising one or more mitogenic with one or more attractant factors or one or more mitoattractant factors or combinations thereof within said support.

29. (Original) The composition of claim 28, wherein the ECs are derived from stem cells.

30. (Original) The composition of claim 29, wherein the stem cells are selected from the group consisting of embryonic stem cells, embryonic germ cells, MAPCs, hematopoietic stem cells, mesenchymal stem cells, and endothelial progenitor cells.

31. (Original) The composition of claim 28, wherein the SMCs are derived from stem cells.

32. (Original) The composition of claim 31, wherein the stem cells are selected from the group consisting of embryonic stem cells, embryonic germ cells, MAPCs, mesenchymal stem cells, and smooth muscle progenitor cells.

33-38. (Canceled)

39. (Currently amended) The composition of claim 29 ~~or 31~~, wherein the stem cells are derived from bone marrow, brain, spinal cord, umbilical cord blood, liver, muscle, fat or placenta.

40. (Original) The composition of claim 28, wherein the matrix is comprised of a substance selected from the group consisting of fibrin, collagen, amphiphilic di-block copolymers, amphiphilic tri-block copolymers, and peptides.

41-45. (Canceled)

46. (Original) The composition of claim 28, wherein the factor is vascular endothelial growth factor.

47-52. (Canceled)

53. (Original) An engineered blood vessel comprising an intimal layer of ECs incorporated in a matrix and a medial layer of SMCs incorporated in a matrix, said layers being circumferentially positioned around a tubular support.

54. (Original) A pharmaceutical composition comprising an engineered blood vessel in a pharmaceutically acceptable carrier, said engineered vessel comprising an intimal layer of ECs incorporated in a matrix and a medial layer of SMCs incorporated in a matrix, said layers being circumferentially positioned around a tubular support.

55. (Original) An in vitro composition comprising ECs and SMCs incorporated in a matrix circumferentially positioned around a tubular support, wherein one or more mitogenic with one or more attractant factors or one or more mitoattractant factors or combinations thereof capable of permeating the support are present within the support.

56. (Canceled)

57. (Original) A method of culturing cells in a matrix comprising the steps of

a. combining ECs and SMCs in a matrix;

b. growing ECs and SMCs in a matrix on the exterior surface of a tubular support, wherein the support allows movement of mitogenic, attractant, and mitoattractant factors from within the support to said ECs; and

c. allowing movement of one or more mitogenic with one or more attractant factors or one or more mitoattractant factors or combinations thereof present within the support to said ECs.

58. (Canceled)